

Serial No. 09/548,414

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This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claim 1 (previously presented): A method of manufacturing an external force detection sensor comprising the steps of:

- providing an element substrate;
- forming a recess in a surface of the element substrate;
- forming an etching stop layer of an electrically conductive material on the surface of the element substrate having the recess formed therein;
- through-hole dry etching the surface of the element substrate using the etching stop layer;
- forming a sensor element including a vibrating body, fixed electrodes and movable electrodes on the element substrate;
- removing the etching stop layer; and
- completing the manufacturing of the external force detection sensor.

Claim 2 (previously presented): A method of manufacturing an external force detection sensor comprising the steps of:

- forming a recessed part on a back surface side of an element substrate;
- forming a membrane on a face side;
- providing an etching stop layer comprising an electrically conductive material on a top surface of the recessed part of said element substrate;
- joining the back surface side of said element substrate with a support substrate;
- and
- forming a sensor element including a vibrating body, fixed electrodes and movable electrodes by dry etching of the membrane of said element substrate;

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removing the etching stop layer; and  
completing the manufacturing of the external force detection sensor.

Claim 3 (original): A manufacturing method of an external force detection sensor according to claim 2, wherein the recessed part is formed in a center portion of a back surface of the element substrate.

Claim 4 (canceled)

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Claim 5 (previously presented): A method of manufacturing an external force detection sensor according to claim 13, wherein the dummy support substrate and the etching stop layer are removed after the sensor element is formed and, after that, a support substrate with a recessed part formed therein is arranged on a back surface side of said element substrate such that the recessed part of said support substrate is arranged opposite to the sensor element and, then the support substrate is joined with the element substrate.

Claims 6-8 (canceled)

Claim 9 (previously presented): A method of manufacturing an external force detection sensor according to claims 2 or 3, wherein the element substrate is formed of a silicon material, the support substrate is formed of a glass material, and the element substrate is anodically joined with the support substrate.

Claim 10 (previously presented): A method of manufacturing an external force detection sensor according to one of claims 1, 2, 3 or 9, wherein the etching stop layer is formed of an electrically conductive material whose etch selectivity which is the ratio

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of the dry-etch rate of an element substrate to the dry-etch rate of an etching stop layer is not less than 1.

Claim 11 (canceled)

Claim 12 (original): A method of manufacturing an external force detection sensor according to claim 10, wherein the etching stop layer is made of titanium or aluminum.

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Claim 13 (previously presented): A method of manufacturing an external force detection sensor according to claim 1, further comprising the step of providing a dummy support substrate to support the element substrate during the step of through-hole dry etching of the element substrate to form the sensor element, wherein the etching stop layer is formed between the element substrate and the dummy support substrate.

Claim 14 (previously presented): A method of manufacturing an external force detection sensor according to claim 1, wherein the etching stop layer is formed in a preset sensor element forming area on a back surface side of the element substrate.

Claim 15 (previously presented): A method of manufacturing an external force detection sensor according to claim 1, further comprising the step of forming a membrane by machining a preset sensor element forming area of the element substrate from both face and back surface sides, and then forming the etching stop layer on a back surface side of the membrane.

Claim 16 (previously presented): A method of manufacturing an external force detection sensor comprising the steps of:

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providing an element substrate;  
providing a support substrate;  
forming a recess in a surface of the element substrate;  
providing an etching stop layer comprising an electrically conductive material on  
a back surface of said element substrate;  
joining the back surface side of said element substrate with the surface of the  
support substrate having said recess formed therein; and  
forming a sensor element including a vibrating body, fixed electrodes and  
movable electrodes by dry etching of said element substrate;  
removing the etching stop layer; and  
completing the manufacturing of the external force detection sensor.

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Claim 17 (previously presented): A method of manufacturing an external force  
detection sensor according to claim 16, wherein the etching stop layer is formed of an  
electrically conductive material whose etch selectivity which is the ratio of the dry-etch  
rate of an element substrate to the dry-etch rate of an etching stop layer is not less than  
1.

Claim 18 (previously presented): A method of manufacturing an external force  
detection sensor according to claim 16, wherein the etching stop layer is made of  
titanium or aluminum.

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